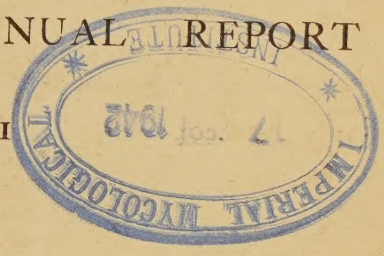
Issued by the Colonial Office

EAST AFRICAN AGRICULTURAL RESEARCH STATION

AMANI

FOURTEENTH ANNUAL REPORT

1941



Crown Copyright Reserved

LONDON
PRINTED AND PUBLISHED BY HIS MAJESTY'S STATIONERY OFFICE
To be purchased directly from H.M. STATIONERY OFFICE at the following addresses:
York House, Kingsway, London, W.C.2; 120, George Street, Edinburgh, 2;
39–41 King Street, Manchester 2; 1, St. Andrew's Crescent, Cardiff;
80, Chichester Street, Belfast;
or through any bookseller

1942

Price 3*d*. net

Colonial No. 183

EAST AFRICAN AGRICULTURAL RESEARCH STATION, AMANI

FOURTEENTH ANNUAL REPORT, 1941.

The work of the Station during the year has been mainly devoted to war-time investigations, full reports on which have been issued separately as each investigation was completed. Certain lines of agricultural research have, however, been continued on a reduced basis, and these are summarised in Part I of this Report.

I.—AGRICULTURAL RESEARCH.

Cassava. Experiments carried out by the Plant Pathologist finally confirmed previous tentative conclusions that the Brown Streak virus is transmitted by the White Fly, that is, by the same vector as the mosaic virus.

From the crosses made in December, 1940, and January, 1941, some 400 seedlings of known percentage were reared. A large proportion of these are back-crosses to cassava of the F1 generation from the cassava x *Manihot glaziovii* cross, and similar back-crosses of the cassava x Tree-cassava cross.

The F1 generation cassava x *Manihot dichotoma* plants fruited for the first time, and from the open-pollinated flowers a number of seedlings were raised.

The Kizugu disease-resistance trials were reaped in August. As in previous years, infection by both mosaic and Brown Streak viruses was very high; but a number of clones came through largely free of one or both. In particular a cassava x cassava cross of the 1937 series survived its second test entirely free from mosaic disease.

Tung (*Aleurites montana*). Individual tree yields were recorded as in past years and showed that individuals have maintained the same relative position in the yield scale for the past three years. Seedling progeny of the higher yielders is now under test. No vegetative propagation of high-yielding types has yet been possible. Seed of Nyasaland selection M.13 was imported for trial.

Coffee. The investigation, referred to in the last annual report, to determine the maximum crop that trees will tolerate without suffering from over-bearing, could not be completed in 1941 owing to pressure of war-work. Interspecific hybrids were raised by the Geneticist from the crosses *C. eugenioides* x *C. excelsa* and *C. canephora* x *C. excelsa*.

Colchicine-treated seedlings of *C. canephora* and *C. eugenioides* are still under observation.

Yield records of selected trees and the progenies from controlled crosses of *C. canephora* have been maintained and continue to demonstrate the overwhelming influence of environmental factors on yield, completely masking differencies in the inherent yielding-capacity of the various lines.

Fibre crops. The Geneticist reports a very marked difference in the development of different species of *Agave* growing in different localities. For instance, at Amani (Sigi) hybrids of *A. angustifolia* x *A. amaniensis* have developed much more slowly than those plants of the same family growing in the lowlands at the Sisal Experimental Station, Ngomeni. There, poling amongst these hybrids began in 1939, whereas at Amani only one pole had been recorded up to the end of 1941. Again, *A. fourcroydes* (Hennequin) fruits freely at Amani but not at the Sisal Station at Mlingano, and Blue Sisal in the Kenya Highlands is reported to pole in the third or fourth year, after producing 70 to 80 leaves only, whereas in the lowlands at Mlingano plants have already produced approximately 180 leaves without poling.

The increasing damage done by sisal weevil to seedlings and breeding material at the Sisal Experimental Station, Mlingano, is a matter for much concern,

since it makes breeding work extremely difficult. Attempts to induce chromosome-doubling in Blue Sisal bulbils by colchicine treatment were unsuccessful.

Maize. Seedlings of the F1 generation of crosses between streak-resistant Peruvian types and others were subjected to greenhouse infection tests, and selected plants were grown to maturity. This work has been discontinued for the time being but seed from controlled pollinations is being preserved in the hope that breeding can be continued later.

Native food crops (other than cassava and maize q.v.). Work was confined to expanding the collection of the food crop varieties and distributing planting material throughout the territories ; preparing and circulating a précis of work done for the improvement of native food crops in the territories during 1940 ; preliminary trials with Striga-resistant sorghums. In December a second edition of the " List of food crop varieties available for distribution " was prepared for publication.

The sorghum variety *Bonghonilo* reported from India to be resistant to *Striga asiatica* was tested against *S. hermonthica* with negative results. Kalipyaung, a Burmese variety, showed some evidence of being resistant to *S. hermonthica* and will be given a further trial.

Vegetable insecticides. A small-scale plot experiment to test the effect of staking *Derris* gave a significant increase of 67 per cent. in yield of dried root over unstaked plants. Other small-scale experiments in progress with *Derris* are designed to determine the effect of time of planting and harvesting, manurial treatment, spacing distance, and hormone-treatment of cuttings.

Ornithology. Investigations have been on a considerably reduced scale, but grants made in the past by the Royal Society of London and the British Museum have allowed the continuation of bird-behaviour observations as well as the collecting mentioned in last year's report. The field work was all carried out by Africans.

Soil science. Investigations were continued, as far as wartime research and leave allowed, and included a tour by the Soil Chemist of sisal estates on the Central Railway Line, Tanganyika.

Systematic botany. Almost 2,000 specimens were received for identification or verification. The need for a flora and a dictionary of economic plant products of East Africa, for the use of technical departments and others, is becoming increasingly evident as the war proceeds. Existing information is scattered, in several languages, and only accessible to botanists.

II.—ADMINISTRATION.

The work of the Station has been handicapped by shortage of staff, particularly Chemists. Four members of the staff were serving with the forces and three seconded for duty elsewhere, of whom one, Mr. Nutter, retired in October because of ill-health. Mr. Stent, Chemist, Coffee Research Station, Lyamungu, was seconded to the Amani staff throughout the year. He acted as Government Analyst, Tanganyika, during March.

In June, Dr. Storey, Plant Pathologist, was seconded to the East African Supplies Board, Nairobi, to serve as Scientific Secretary to the newly formed East African Industries Technical Advisory Committee, an arrangement that greatly facilitates contact between research officers and the military and civil authorities.

Amani Plantations. Existing plantations were maintained and small areas of the following planted for experimental purposes ; aniseed, *Cascara sagrada*, *Chenopodium ambrosiodes*, cocaine, *Cinchona*, *Digitalis*, *Melaleuca*

alternifolia, Ocimum kilimandscharicum, opium poppy, and senna. There was an increased demand for planting material of certain economic crops.

The toll taken by tsetse-fly amongst our cattle continues.

Kwamkoro Estate, Re-development (C.D.F.) *Derris* continues to thrive. The area planted in 1941 was increased to 150,000 plants ; normally only 30,000 are planted each year. One and a half tons of dry root were harvested and some 44,000 cuttings distributed to planters and others. *Cinchona* and tung continue to show promise in those areas where the soil is reasonably good. A small crop of tung can be expected in 1942. Robusta coffee is promising well where it is manured but not in other areas.

Losses amongst the cattle from trypanosomiasis were higher than in 1940, 54 animals becoming infected, of which 11, or 7 per cent. of the herd, died.

East African Central Quarantine Station. Importations consisted of fodder cane varieties from Mauritius and Jalap tubers from India. Suckers of Manilla Hemp varieties imported from Malaya in 1940 were released and forwarded to Uganda.

East African Agricultural Journal. Contributions of good quality were received in ample volume throughout the year. There seems no doubt that the Journal serves a real need as a channel for publication of matter of local importance.

Amani library facilities. Memoranda were prepared for the East African Industries Technical Advisory Committee and other bodies on various subjects, including bottle making, asbestos-cement board, preservation of fishing-nets, rubber substitutes, condensed milk and milk powder.

With the increased demand for information on subjects not hitherto much dealt with it seemed important that the resources of the East African libraries should be as widely known and generally available as possible. Technical departments and others were therefore asked if they could deposit at Amani catalogues of their libraries and if they would agree to lend publications to others participating in the scheme. The response was good. As a further contribution to the same object a new edition of the Amani library catalogue was prepared.

Publications. With the almost total diversion of scientific officers' time to problems of immediate war supplies publications declined to a very low ebb. It is hoped that the numerous correspondents with whom the Amani Library is in exchange relations will not be deterred from sending their publications to us as before, pending the time when we can reciprocate more fully.

A. GLENDON HILL,
Director.

Amani,
March, 1942.

APPENDIX A.

Financial Statement for the year ended 31st December, 1941.*

REVENUE.

	£
H.M. (Imperial) Treasury	6,000
Contribution, Tanganyika Territory	4,500
,, Kenya	2,400
,, Uganda	2,500
,, Zanzibar	650
,, Northern Rhodesia	1,000
,, Nyasaland	650
	17,700
Local Revenue	432
	£18,132

EXPENDITURE.

	£
Maintenance :—	
Personal emoluments, pay	11,304
Passages	165
Pensions contributions	2,014
Laboratories	1,267
Publications	49
Office, telephones and contingencies	204
Materials	312
Freight and transport	257
Travelling	667
Labour	1,523
	17,762
Special (from reserve) :—	
New motor transport	200
Production of galenicals	45
,, petrol from vegetable oils	93
	£18,100

SUMMARY.

	£	£
Revenue in 1941	18,132	
Reserve on 31st December, 1940	6,057	
		24,189
Expenditure in 1941		18,100
Gross reserve on 31st December, 1941		£5,089

* A forecast. Final accounts not yet received from Accountant General, Dar es Salaam.

APPENDIX B.

List of Publications distributed during 1941 by the East African Agricultural Research Station.

MEMOIRS.

75. Hornbill Studies. R. E. & W. M. Moreau. *Ibis* ser. 14, Vol. 4, pp. 639–656, 1940.
76. A method for the continuous measurement of transpiration from single leaves under natural conditions. J. Glover. *Ann. Bot.* (NS) Vol. 5 (17), pp. 25–34.
77. Studies of the physiology of *Coffea arabica* III. F. J. Nutman. *Ann. Bot.* (NS) Vol. 5 (17), pp. 59–81.
78. The land vertebrates of Pemba, Zanzibar and Mafia ; a zoo-geographical study. R. E. Moreau & R. H. W. Pakenham. *Proc. Zool. Soc. London* ser. A, Vol. 110 (3–4), pp. 97–128, 1940.
79. Helopeltis on Cinchona. T. W. Kirkpatrick. *Bull. Ent. Res.* Vol. 32 (2), pp. 103–110, 1941.

REPRINTS.

12. Bird-names used in coastal north-eastern Tanganyika Territory. R. E. Moreau. *Tanganyika Notes and Records.* No. 10, pp. 1–26, 1940.
13. East African plants of proved or potential value as drug producers. *East Afr. Agric. J.* Vol. 6 (3), pp 127–134, 1941.
14. Some experiments on staking of derris. R. R. Worsley. *E. Afr. Agric. J.* Vol. 6 (4), p. 236, 1942.
15. A contribution to the breeding biology of the Palm Swift. R. E. Moreau. *J. E. Afr. Uganda. Nat. Hist. Soc.* Vol. 15 (3–4), pp. 154–170, 1941.
16. Gum, resinous and mucilaginous plants in East Africa. P. J. Greenway. *E. Afr. Agric. J.* Vol. 6 (4), pp. 241–250, 1941.

(20519). Wt. P 435—4559 625 8/42 D.L. G. 377/7

S.O. Code No. 88-393-83-41*